welcomed by geographers and geologists all over the world. The work is written in the Danish language, but a *résumé* in French, by M. F. Johnstrup, enables readers unacquainted with the former language to become possessed of the interesting facts contained in the volume. The work contains four memoirs of great interest: an account of the expedition upon the inland ice, made by Lieut. Jensen in 1878; a record of the astronomical and meteorological observations made during this journey; notes on the geology of the west coast of Greenland, by M. Kornerup; and remarks upon the plants collected by the last named explorer, by M. Lange.

In the year 1870 Prof. Nordenskjold, setting out from the vicinity of Disco Bay in company with Dr. Berggren, was able to penetrate to a distance of thirty miles into the interior, at which point the continental ice was found to attain a height of 2,200 feet. Starting from the neighbourhood of Frederikshaab, in South Greenland, Lieut. Jensen traversed a distance of forty-six miles over the continental ice. Here he found, as did Dalager, who made a similar attempt from the same point in 1751, that a number of islands of rock (Nunatakker) rise above the general level of the great sea of ice, and upon these rocky islets no less than fifty-four species of plants were collected.

The observations of most general interest, however, which were made by this expedition, were those which relate to the condition and movements of the great sheet of ice that covers the interior of the island. We cannot do better than give the *résumé* of these observations, which is furnished by M. Johnstrup; it is as follows:—

1. At a distance of 75 to 76 kilometres from the shore, the continental ice attains a height of 1,570 metres (5,115 feet), and must be of considerable thickness, since its inclination to the east from the Isblink of Frederikshaab averages only 49′.

2. On that part of the continental ice which has been explored even at a great distance from the shore, are found many "Nunatakker," which influence to a great extent the movement of the ice, in some cases actually bringing about a reversal of the direction.

3. The surfaces of dislocation resulting from the movement of the ice are almost vertical in the midst of the continental ice, but they incline at the edge and near the "Nunatakker," where the slope of the ground is great, and the upper parts of the ice, in consequence, move more rapidly.

4. The crevasses are partly perpendicular, partly parallel to the direction of the movements, following the nature of the inequalities of the rocky bed, and in places where the ice takes a fan-like disposition, both radial and tangential crevasses are observed.

5. Around the "Nunatakker" and the rocks near the shore, the surface of the continental ice is impregnated with fine rocky *débris* (sand and clay) which are brought there by tempests, and which brooks carry from a distance to the cavities of the continental ice. The masses of clay thus collected give rise to the pyramids of ice which near the Isblink of Frederikshaab, attain an elevation of nearly 60 feet.

6. Moraines of different form are found on the continental ice, especially near the "Nunatakker," and they must be referred to the classes of ground "moraines and terminal" moraines. They frequently form curved or semi-circular lines, and inclose well rounded masses of stone of no great magnitude, which in their advance fall into the crevasses.

Next in interest and importance to the investigations upon the continental ice of Greenland, we must regard the new facts on the geology of the few portions of the country uncovered by the great ice mantle, with which this work furnishes us. A geological map of the West Coast of Greenland from Godthaab to Tingingnertok shows the rocks exposed along the coast and in the islets which rise above the great ice-sheet to be mostly composed of gneiss with some mica-, talc-, and hornblende-schists, and occasional patches of granite.

New proofs of the gradual elevation going on in past times on the West Coast of Greenland are furnished in the work before us. Five sets of raised-beaches are described occurring at heights of 28, 57, 94, 192, and 326 feet above the sea-level respectively. On the other hand there is clear evidence that the land is, at the present time, slowly subsiding, the extent of this movement being shown to have been at Lichtenfels from 6 to 8 feet since the year 1789.

The work we have been noticing is illustrated with several valuable maps and plates, together with numerous woodcuts; and the succeeding parts will be looked forward to with much interest by those who desire to know more concerning that veritable *terra incognita*, the interior of Greenland.

OUR BOOK SHELF

A History of the Tin Trade. By P. W. Flower. (London: George Bell and Sons, 1880.)

THE author, who is well known as one of the largest manufacturers of tin plates, and also as having introduced into this country the French method of decorating tin plates by lithographic printing, has in this volume collected numerous interesting facts in connection with the early history of the manufacture in South Wales, and, what is of more value, has reprinted those parts of the scarce work of Andrew Yarranton, "England's Greatness," 1677, that refer to his journey into Saxony for the purpose of learning the method of tinning sheet-iron. With these are associated extracts from other not very well known works, translations of the accounts of tin-plate making published at various times in the last century by Réaumur, Diderot (in the "Encyclopédie") and Jars, and those of Parkes, 1818, and Ebenezer Rogers, 1857, the latter from the *Transactions* of the South Wales Institute of Engineers. No notice, however, is taken of the later and more complete account published in Percy's "Iron and Steel." An introductory chapter on the metallurgy of tin, and a subsequent one on the modern manufacture of tin plate, are exceedingly feeble. The former is derived from such sources of information as Dodd's "Manufactures in Metal" and the "Beauties of England and Wales," and the latter, though containing matter that may interest those who are acquainted with the details of the process, will not convey much information to those who are not. The final portion of the volume deals with economic details and statistics; the latter of some elaboration, but from four to six years after date, and the prices in different European seats of manufacture are represented by prices current in 1872-73-74. There are several curious errors which can scarcely have been expected to be found, as, for instance, the "Lamb and Flag" brand on tin ingots is said to be the stamp of the

Duchy of Cornwall; vitriol is the fume given off by heated sulphur; and the refinery in the tin-plate forge is only a melting-furnace. Altogether the author treats the South Wales forge process, one of the most subtle and delicate in the whole range of iron metallurgy, somewhat scantily.

H. B.

Mathematical Tables, chiefly to Four Figures. First Series. By James Mills Peirce, University Professor of Mathematics in Harvard University. (Boston, U.S.: Ginn and Heath, 1879.)

THIS is a well-arranged and clearly printed book of forty-three octavo pages. Besides four figure logarithms of numbers and of circular functions, and the circular functions themselves, it contains a table of logarithms of hyperbolic functions, occupying three pages, Gaussian logarithms of sums and differences, inverse circular functions (the argument being the log. sine, &c.), and a special table for finding the logarithms of circular functions of small angles, which is to be used by reducing the angle to minutes, and then adding its logarithm to a logarithm given in the table. There is no table of antilogarithms, but it is not needed, as the logarithms of numbers extend over more than a complete cycle, beginning with the number 100, and ending with 1999, so that the differences between successive logarithms are always small. A saving of space, without loss of utility, has been obtained by carrying the proportional parts only as far as 5 instead of to 9 as usual. This involves subtraction for 6, 7, 8, and 9, but the quantity to be subtracted is so small that the operation can be performed mentally. The sixteen pages of "Explanation of the Tables," including a page and a half on Hyperbolic Functions, are remarkably clear and good.

J. D. E.

Eight Months in an Ox Waggon. By E. F. Sandeman. (London: Griffith and Farran, 1880.)

MR. SANDEMAN has written a most interesting volume on his experience in South Africa. His party made their expedition to the Transvaal in an ox waggon. It is the story of their adventures, during the time they were hunting there, that is told in this volume. The book is, however, by no means a diary of the daily doings in the Transvaal. It abounds in reminiscences of Boer life, and accounts of the natural history of the country. In the latter respect Mr. Sandeman has shown that he is a good observer. We can only give a few extracts. Speaking of ant-bears, he says:—

"The holes of the ant-bear are sometimes five or six feet deep, and large enough to engulf horse and rider; but as they are generally conspicuous, they do not prove so dangerous as the smaller holes of the mere-cat, a pretty little animal between a rat and a stoat, found all over South Africa."

The various changes in the bird and insect-life in the Transvaal, as the day passes on, seems to be very much marked and curious. "As the heat of the day comes on, the game of all descriptions retires to the shade, and is neither to be seen nor heard, and the air is full of gorgeous insects of every size and colour, from the large butterfly, flitting from reed to reed, to the sphinxes and sand-flies, whose movements as they dart and glance through the sunlight are too quick for the eye to follow. Darting after these, and glancing like little bolts of shiny gold or silver, set with emeralds and rubies, are innumerably brilliantly plumaged small birds, who again retire into the reeds when the butterflies shut up their wings as the heat of the sun ceases to warm them into activity. But the cooling atmosphere is far from being tenantless; for, as the sun goes down, myriads of clear-winged long-bodied flies swarm up from the ground, and after these there dart out from their hiding-places of the day a devouring crowd of black-birds with white tails, who gobble up the flies by the dozen. A large kind with gold feathers in their wings also assist at the banquet; and a smart little wagtail has a larger share perhaps than either of the others, for he is quicker in his movements, and never misses his dart. When these go to bed later on, owls, night-hawks, bats, crickets, frogs, and jackals, combine to break the stillness of the night with their harsh discordant cries and croakings."

Farther on in the book we have a long account of how a honeybird led the author and his friends to find honey. From the description one must think this bird had reasoning powers almost human. Throughout the book are descriptions of the scenery of the country. We only quote one paragraph:—

"The scenery became wilder as we advanced. The hills were loftier and more broken up, and here and there covered up with thick brushwood. The veldt itself was strewn with quartz rocks, and rugged boulders. The streams were full of beautiful quartz pebbles worn smooth by the constant friction. Many of the rocks have streaks of pure iron in them, and on every side are relics of the volcanic action, which must have formed the greater part of the Transvaal."

The book is written in a simple and attractive style. It will be of considerable interest to naturalists and to those who may meditate a similar hunting expedition in the Transvaal. We would recommend it as an interesting and instructive record of a holiday. It contains a large, useful map of the Transvaal and the surrounding territories.

The Countries of the World. By Robert Brown, M.A. (London: Cassell, Petter, Galpin, and Co., 1879.)

THE present volume of "The Countries of the World" is devoted to Polynesia, Australasia, Malaysia, and Japan. The people who inhabit these islands having been fully discussed in another volume, there is only a brief sketch of them given here. The author, in his compilation, takes us first through the Polynesian islands, gives a general idea of the plants and animals peculiar to them, short accounts of the mode of government and the present state of the country. All this is done in a pleasant and interesting manner. New Zealand, Australia, and Japan are treated in the same way. Our Australian colonies are described more fully. The numerous illustrations throughout the book will be a great attraction to it. They are very well done.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Light of Webb's Planetary Nebula (DM. + 41° 4004)

THE recent discovery by the Rev. T. W. Webb, that the star DM. + 41° 4004 is a planetary nebula, and the attention which has consequently been attracted to this object, induce me to send herewith the result of a measurement of its light made at the Harvard College Observatory. Observations are in progress upon the light, dimensions, and spectra of all known planetary nebulæ visible in this latitude. To avoid the repetition of similar errors, two or three observers take part in the work, and each makes only one series of observations upon the same nebula in a single evening.

The photometric measurements are made by throwing the image of a star out of focus to such an extent that its intrinsic brightness becomes apparently equal to that of the nebula which is simultaneously observed with the same eye-piece. Each determination consists in six comparisons made alternately inside and outside of the focus of the auxiliary telescope through which the star is seen. The light of the nebula is expressed by the